

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING – DIVISION OF FINANCIAL ASSISTANCE
DECEMBER 4, 2007**

ITEM 6

SUBJECT

CONSIDERATION OF A RESOLUTION FOR AUTHORIZATION TO ENTER INTO AN AGREEMENT FOR WATER RECYCLING RESEARCH WITH THE WATEREUSE FOUNDATION

DISCUSSION

The Costa-Machado Water Act of 2000, also known as the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act or Proposition 13 (2000 Bond Law), included funding for water recycling research. The 2000 Bond Law provides that the State Water Resources Control Board (State Water Board) may use funds to undertake plans, surveys, research, development, and studies necessary or desirable to carry out water recycling, including the preparation of comprehensive Statewide or areawide studies and reports on the collection, treatment, and disposal of waste and wastewater recycling (Water Code Sections 79144 and 79145).

The State Water Board has previously approved two agreements for a total of \$2 million from the 2000 Bond Law funds to support water recycling research administered by the WaterReuse Foundation (WRF). The purpose of this agenda item is to consider a research agreement with the WRF for an amount not to exceed \$650,000 to continue funding water recycling research studies.

Background

According to projections of the 2002 Recycled Water Task Force, California has the potential to recycle an additional 1,400,000 to 1,670,000 acre-feet per year of water beyond the 2002 level by 2030. Achieving this potential requires greater public acceptance and confidence that the use of recycled water is safe for uses such as indirect potable reuse and irrigation of edible crops. To help address these and other issues that will help facilitate the increased use of recycled water, additional research is needed on the effectiveness of new technologies, emerging chemicals of concern, salinity management, virus removal, microbiological safety of water used on edible crops, environmental concerns such as climate change impacts, economics and effective marketing methods of recycled water. Substantial agreement exists among water recycling practitioners, regulators, consultants, and academics on the continuing need to conduct water recycling research.

On January 18, 2007, the Division of Financial Assistance (Division) approved the "Strategic Plan, January 2007-December 2008, Water Recycling Funding Program, Division of Financial Assistance" (Performance Plan). The Performance Plan identifies several key strategic projects that, if implemented, can support our efforts of increasing the State water supply by promoting and funding water recycling projects and research. Specifically, the Performance Plan calls for the Water Recycling Funding Program (WRFP) to act as a partner and catalyst in Statewide efforts to promote water recycling, including continuing financial support of the research

program of the WaterReuse Foundation (WRF). In addition, the Performance Plan calls for the WRFP to track performance of funded projects, and to conduct a comprehensive analysis of a select group of previously funded projects to compare the planned benefits, costs, and recycled water deliveries with actual performance. The findings of such an analysis will be summarized in a report.

WaterReuse Foundation

The WRF is an educational, nonprofit public benefit corporation that serves as a centralized organization for the water and wastewater community to advance the science of water reuse, recycling, reclamation, and desalination. The WRF's research covers a broad spectrum of issues including chemical contaminants, microbiological agents, treatment technologies, salinity management, public perception, economics, and marketing.

In May 2001, the State Water Board approved [Resolution No. 2001-049](#), which authorized the Executive Director or designee to execute a \$1 million agreement with the WRF to conduct water recycling research. The grant was used to match \$1 million provided by the U.S. Bureau of Reclamation (USBR), and contributions from WaterReuse Association members, WRF subscribers, and other sources.

In February 2003, the WRF submitted a proposal requesting an additional \$1 million of water recycling research funds. This was approved in May 2003 by State Water Board [Resolution No. 2003-0037](#), and a second agreement was executed.

All of the \$2 million contracted to the WRF has been allocated. Under agreement provisions, 20 percent of the agreement funds are used to reimburse the WRF for expenses in conducting the research program and sponsoring workshops to set research priorities. The remaining funds are allocated to research subcontracts. Thirty research subcontracts have been funded as shown in Table 1. The State Water Board funds were leveraged by the WRF to fund \$5.9 million in studies, not including in-kind services provided by the study sponsors.

The WRF has requested \$500,000 in additional funds to continue its research program and to match funds from other sources, in particular, the USBR. In addition, the Division proposes to use the WRF to administer \$150,000 of State funds to conduct a comprehensive analysis of a select group of previously funded projects, as called for in the Performance Plan. The Division is requesting Board approval for an amount not to exceed \$650,000 for a new agreement (Agreement) with the WRF.

The WRF updates research areas by obtaining input from its Board of Directors, subscribers, research partners, research needs assessment workshops, and the Research Advisory Committee (RAC). The State Water Board is a member of the RAC and participates in the research needs assessment workshops. Workshops are attended by leading professionals in water reuse, including academic researchers, scientists, engineers, and policy-makers from Federal, State, and local government, and consultants. The first workshop was conducted by the National Water Research Institute in 1999. The most recent workshop was conducted by the WRF in November 2006. Priority categories based on these workshops are incorporated into our contract with the WRF in the Scope of Work. Specific research or study topics are developed by the WRF, which issues requests for proposals and evaluates and selects proposals for funding. Division staff reviews the requests for proposals and submitted proposals, and participates in the selection process. Based on the most recent research needs

workshop, the Division proposes to include research categories in the Scope of Work of the WRF Agreement as shown in Table 2.

The WRF proposes to the State Water Board which research subcontracts it would like funded with State Water Board funds and how much to allocate to each. The Division approves which studies to participate in, based on how they relate to the research categories in the Agreement with the WRF, the State Water Board priorities, and the potential benefit to California. As part of the proposed \$650,000, the Division intends to use \$150,000 for conducting a comprehensive performance evaluation of funded recycled water projects. The WRF would solicit a contractor and administer a subcontract on behalf of the Division.

POLICY ISSUE

Should the State Water Board authorize the Executive Director, Chief Deputy Director, the Deputy Director of the Division, or designee to negotiate, execute, and amend, as necessary, an Agreement with the WRF for an amount not to exceed \$650,000?

FISCAL IMPACT

This Agreement will be fully funded by the Water Recycling Subaccount of the 2000 Bond Law. A total of up to three percent of the amount deposited in the Water Recycling Subaccount of the 2000 Bond Law may be used for the purposes of studies, research, and demonstration activities, as described above. Three percent of the initial Subaccount balance of approximately \$100 million was \$3 million. Three percent of water recycling loan repayments deposited into the Subaccount have increased this amount. Commitments of these funds and the current balance are shown in the table below. Currently, new research funds derived from loan repayments amount to about \$100,000 annually. They are allowed to accumulate until appropriate funding opportunities develop.

Initial 2000 Bond Law allocation from the Water Recycling Subaccount	\$3,000,000
Allocation from loan repayments and SMIF interest	+ 1,086,036
WateReuse Foundation research (2001)	- 1,000,000
2002 Recycled Water Task Force	- 29,430
San Diego County Water Authority Regional Planning Grant (April 2003)	- 508,891
WateReuse Foundation research increase (2004)	- 1,000,000
Proposed WateReuse Foundation research Agreement	- 650,000
Proposed Agreements and subcontracts, if appropriate, with Common Ground, UCD Dept. of Civil and Environmental Engineering and Agricultural and Resource Economics	-300,000
Balance:	\$597,715

REGIONAL BOARD IMPACT

None.

STAFF RECOMMENDATION

That the State Water Board authorize the Executive Director, the Chief Deputy Director, the Deputy Director of the Division, or designee to negotiate, execute, and amend, as necessary, an Agreement with the WRF for an amount not to exceed \$650,000.

Table 1. WaterReuse Foundation Projects Funded by State Water Board

Project Number	Project Title	Total WRF Budget ^a	SWRCB Budget ^b	Actual/Anticipated Completion Date
WRF-01-001	Develop Low Cost Analytical Method for Measuring NDMA	250,000.00	33,750.00	Published December 2005
WRF-01-002	Removal and/or Destruction of NDMA in Wastewater Treatment Processes	350,000.00	105,000.00	Published May 2006
WRF-01-004	Understanding Public Concerns of Indirect Potable Reuse Projects	305,000.00	60,000.00	Website Active July 2006
WRF-02-001	Rejection of Wastewater-Derived Micropollutants in High-Pressure Membrane Applications Leading to Indirect Potable Reuse	221,500.00	62,250.00	Published May 2006
WRF-02-002	Investigation of NDMA Fate and Transport	546,000.00	50,000.00	Published July 2006
WRF-02-003	Filter Loading Evaluation for Water Reuse	400,000.00	65,000.00	2008
WRF-02-004	National Database on Water Reuse Facilities	357,600.00	100,000.00	Report in production
WRF-02-006	Concentrate Disposal Research Projects (JWR&DTF Projects)	385,000.00	50,000.00	December 31, 2007
WRF-02-007	Comparative Study of Recycled Water Irrigation and Fairway Turf	10,000.00	5,000.00	Published 2003
WRF-02-011	A Protocol for Developing Water Reuse Criteria with Reference to Drinking Water Supplies	10,000.00	5,000.00	Published 2005
WRF-03-001	Pathogen Removal and Inactivation in Reclamation Plants - Study Design	100,000.00	37,500.00	Report in production
WRF-03-005	Marketing Strategies for Non-Potable Recycled Water	150,000.00	56,250.00	Published September 2006
WRF-03-006	Economic Analysis of Sustainable Water Use - Benefits and Cost	230,000.00	75,000.00	Published September 2006
WRF-03-009	Reclaimed Water Aquifer Storage and Recovery: Potential Changes in Water Quality	200,000.00	75,000.00	Report in production
WRF-03-014	Development of Indicators and Surrogates of Chemical Contaminants and Organic Removal in Wastewater and Water Reuse	300,000.00	20,250.00	December 2007

Project Number	Project Title	Total WRF Budget ^a	SWRCB Budget ^b	Actual/Anticipated Completion Date
WRF-04-008	Understanding Mental Models of Water: Origins, Quality, Contamination, Naturalness, and Risk	140,000.00	46,667.00	May 1, 2008
WRF-04-010	Extend the IRP Process to Include Water Reuse and Other Non-Traditional Waters	110,000.00	36,667.00	Report in production
WRF-04-011	Application of Microbial Risk Assessment Techniques to Estimate Risk Due to Exposure to Reclaimed Waters – Phase 1	125,000.00	41,667.00	Report in production
WRF-04-012	Development of a Guidance Document for Applying Sound Statistics for Exploring, Interpreting, and Presenting Microbial Data Associated with Reclaimed Water Systems	89,878.00	30,000.00	December 31, 2007
WRF-04-013	Improved Sample Collection and Concentration Method for Multiple Pathogen Detection	175,000.00	58,333.00	September 30, 2007
WRF-04-014	Decision Support System for Selection of Satellite vs. Regional Treatment for Reuse	135,000.00	45,000.00	December 31, 2007
WRF-04-017	Reaction Rates and Mechanisms of AOP Technologies for Water Reuse	120,000.00	40,000.00	October 31, 2008
WRF-05-002	Microbiological Quality and Biostability of Reclaimed Water Following Storage and Distribution	300,000.00	123,288.00	March 6, 2009
WRF-05-003	Alternative Viability/Infectivity Surrogates for Giardia for Which Cell Culture Infectivity Assays Are Not Available	250,000.00	102,740.00	TBD
WRF-05-004	Development of Surrogates to Determine the Efficacy of Soil Aquifer Treatment Systems for the Removal of Organic Chemicals	200,000.00	82,190.00	December 2, 2009
WRF-05-005	Identifying Hormonally Active Compounds, Pharmaceutical Ingredients, and Personal Care Product Ingredients of Most Health Concern From Their Potential Presence in Water Intended for Indirect Potable Reuse	100,000.00	41,095.00	TBD
WRF-05-008	The Effect of Salinity on the Removal of Contaminants of Concern during Biological Water Reclamation	99,675.00	35,287.00	November 14, 2007
WRF-05-009	Dewatering Reverse Osmosis Concentrate from Water Reuse Applications Using Direct Osmosis	80,000.00	50,750.00	Report in production

Project Number	Project Title	Total WRF Budget ^a	SWRCB Budget ^b	Actual/Anticipated Completion Date
WRF-05-010	Oxidative Destruction of Organics in Membrane Concentrates	90,000.00	30,064.00	December 31, 2007
WRF-05-011	Assessment of the Potential Presence of Chemical Contaminants in Water Produced by Desalination Systems	60,000.00	36,250.00	May 21, 2008
Total	30 Projects	5,889,653	1,599,998	

^a Does not include in-kind services contributed by project participants.

^b The State Water Board funds were leveraged by contributions from the WRF subscribers, the WaterReuse Association members, the USBR, and other sources.

Table 2. Research Categories in Proposed WaterReuse Foundation Agreement

1	Develop acceptable water quality criteria for alternative end uses of recycled water with respect to serving the needs of the end use, and protecting public health and the environment;
2	Assess the occurrence or risk of pathogens and chemicals in recycled water;
3	Develop analytical techniques for measuring the presence or risk of pathogens and chemicals, including the use of appropriate surrogates or indicators;
4	Evaluate the effectiveness or impact of treatment technologies on the occurrence or removal of pathogens or chemicals of public health significance;
5	Develop design or operational criteria for optimum treatment for water reuse, including consideration of performance parameters, removal mechanisms, costs, and public health, resource and environmental impacts;
6	Investigate design, operational, and public health issues related to the storage and distribution of recycled water;
7	Evaluate source control measures for prevention or reduction of pathogens or chemicals of concern in recycled water;
8	Analyze or develop the tools for analysis of the economics and financing of water reuse;
9	Determine the environmental impact and resource use, including climate change impacts, resulting from the treatment, distribution, and use of recycled water;
10	Investigate the social, political, or institutional factors affecting the acceptance or implementation of water reuse and develop techniques for improving acceptance and implementation, including public participation techniques;
11	Assess the impact and management of salinity in recycled water, including treatment, source control, and brine disposal;
12	Implement and populate an electronic water recycling inventory; and
13	Perform a comprehensive performance analysis of a select group of completed projects to compare the planned benefits, costs and recycled water deliveries with actual performance

DRAFT

STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2007-

AUTHORIZATION TO ENTER INTO AN AGREEMENT FOR WATER RECYCLING RESEARCH WITH THE WATERREUSE FOUNDATION (WRF)

WHEREAS:

1. The Costa-Machado Water Act of 2000 (also known as Proposition 13 or the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act) established the Water Recycling Subaccount, and authorizes the State Water Resources Control Board (State Water Board) to use a portion of it to fund water recycling research.
2. The Division of Financial Assistance (Division), through the Water Recycling Funding Program (WRFP), administers an on-going research funding program using funds authorized under the Costa-Machado Water Act of 2000.
3. On January 18, 2007, the "Strategic Plan, January 2007-December 2008, Water Recycling Funding Program, Division of Financial Assistance" (Performance Plan) was approved by the Division. The Performance Plan calls for the WRFP to act as a partner and catalyst in statewide efforts to promote water recycling, including continuing financial support of the research program of the WRF. In addition, the Performance Plan calls for the WRFP to track performance of funded projects and to conduct a comprehensive analysis of a select group of previously funded projects to compare the planned benefits, costs, and recycled water deliveries with actual performance.
4. The WRF, an educational non-profit public benefit corporation that serves as a centralized organization for the water and wastewater community to advance the science of water recycling and desalination research, is one of the preeminent water recycling research funding organizations in the nation.
5. State Water Board [Resolutions No. 2001-049](#) and [No. 2003-0037](#) authorized the Executive Director, or designee to negotiate, execute, and amend, as necessary, an agreement with the WaterReuse Foundation regarding implementation of the Foundation's water recycling research program in two increments of \$1 million each.
6. The WRF has requested \$500,000 to continue its water recycling research program by funding research studies. In addition, the Division proposes to use the WRF to administer \$150,000 of State funds to conduct a comprehensive performance analysis of a select group of previously funded projects, as called for in the Performance Plan.
7. The WaterReuse Foundation will match the additional \$500,000 with United States Bureau of Reclamation funds, other funds, and in-kind services.

D R A F T

THEREFORE BE IT RESOLVED THAT:

1. The State Water Board authorizes the Executive Director, the Chief Deputy Director, the Deputy Director of the Division, or designee to negotiate and execute an Agreement with the WRF, for an amount not to exceed \$650,000, and to make additional amendments as necessary.
2. The State Water Board authorizes the Executive Director, the Chief Deputy Director, the Deputy Director of the Division, or designee to perform all acts and to do all things necessary and convenient to implement such an agreement.

CERTIFICATION

The undersigned, Acting Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on December 4, 2007.

Jeanine Townsend
Acting Clerk to the Board